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ABSTRACT

This study is concerned with evaluating some demographic and policy-relevant attributes of central cities that have been proposed as determinants of class-specific, white, city-to-suburb movement. Drawing on migration data from the 1970 census for 39 metropolitan areas, the present investigation: (1) evaluates the aggregate impact that the white city-to-suburb movement imposes on the class structures of large central cities; (2) isolates demographic and policy-relevant flight determinants for white movers at different status levels; and (3) estimates the aggregate impact that policy-relevant attributes impose on the population compositions of individual central cities as a result of city-to-suburb movement. Findings presented indicate that: (1) upper-status white flight is responsive to the central city's racial composition, although this effect is moderated in Southern cities; (2) there exists a feedback relationship between suburb-city disparities in per capita educational expenditures and upper-status flight; and (3) both of these explanations are more important in accounting for the out-movement of a city's college-educated population than for the out-movement of other education classes. A demographic decomposition technique is then employed in the study to estimate the hypothetical redistribution consequences that would be associated with equalizing suburb-city fiscal disparities, lowering the city crime rate, and reducing the percentage of the city's black population.
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CLASS-SPECIFIC WHITE FLIGHT: A COMPARATIVE ANALYSIS OF LARGE AMERICAN CITIES

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Class-Specific White Flight:

A Comparative Analysis of Large American Cities

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ABSTRACT

This study is concerned with evaluating some demographic and policy-relevant attributes of central cities that have been proposed as determinants of class-specific, white, city-to-suburb movement. Drawing on migration data from the 1970 census for 39 metropolitan areas, the present investigation: (1) evaluates the aggregate impact that white city-to-suburb movement imposes on the class structures of large central cities; (2) isolates demographic and policy-relevant flight determinants for white movers at different status levels; and (3) estimates the aggregate impact that policy-relevant attributes impose on the population compositions of individual central cities as a result of city-to-suburb movement.

It is found that "white flight" in the late 1960s is still selective with regard to social status, and that out-movement toward the suburbs can account for a substantial percentage of a city's college-educated population. The magnitude of this out-movement varies widely across metropolitan areas and the greatest losses are imposed on older, Northern, central city populations. Upper-status flight occurs to a greater degree in central cities with large black populations and in metropolitan areas where suburban per capita educational expenditures exceed those in the central city. This latter finding lends partial support to the hypothesis that a "feedback relationship" exists between suburb-city fiscal disparities and upper-status flight.

In the final portion of the analysis, a demographic decomposition technique is employed to estimate the hypothetical redistribution

consequences that would be associated with equalizing suburb-city fiscal disparities, lowering the city crime rate, and reducing the percentage of the city's black population. In none of these situations are there substantial reductions in city-to-suburb movement levels or significant increases in the cities' upper-status populations. These findings suggest that policy-alterable attributes can effect only minimal changes in the magnitude and character of white suburbanward relocation over a short-run migration interval.

Class-Specific White Flight:
A Comparative Analysis of Large American Cities

1. Questions Raised

Planners and policy-makers in older American cities have been forced to cope with the continuing phenomenon of "white flight" for much of the post-World War II era. During the period between 1960 and 1970, central cities in U.S. metropolitan areas experienced a net white out-migration of 9.6 percent. For central cities in the Northeast Region, the percentage increases to 16.2. The most damaging aspect of this flight from the perspective of a city's economic viability is not the out-movement of whites per se, but the loss of its upper-status, high-income population--a subgroup which tends to be overwhelmingly white. The gradual erosion of this population element affects the central city's well-being both directly, via a reduced tax base, and indirectly, by contributing to a further deterioration of the social and physical environment in the central core. If one considers only the numbers involved, it might be argued that the bulk of the metropolitan upper-status population has already been redistributed to the suburbs in the most affected SMSAs (Standard Metropolitan Statistical Areas). This fact merely underscores the gravity of the situation for cities in these areas, and emphasizes their concern that even further erosion should not take place. This concern has stimulated a good deal of debate over the out-migration consequences of proposed public policies such as ghetto enrichment or central city school desegregation (Kain and Persky, 1969; Harrison, 1974; Pettigrew and Green, 1976). Moreover, urban economists have suggested that a

feedback-relationship may be operating, so that the city's fiscal ills add additional impetus to upper-status flight (Hirsch, 1971; Peterson, 1976).

Despite recent debates and the fact that central city white flight has been a part of urban population dynamics for well over a quarter of a century, there is a paucity of empirical work that can be used to ascertain the causes of upper-class flight. A good many studies have documented the existence of city-suburban social class differentiation at a single point in time (see Schnore, 1965, and the bibliographies in Pinkerton, 1969, and Johnston, 1971), while a somewhat smaller number of analyses have examined longitudinal changes in the social compositions of residential areas (Schnore and Pinkerton, 1966; Hunter, 1974; Speare, Goldstein and Frey, 1975) and the selectivity of migration streams which bring about such changes (Goldstein, 1964; Taeuber and Taeuber, 1964; Farley, 1976). Unfortunately, most of this research merely describes past patterns and does not provide insights into selective migration responses and redistributional consequences that are associated with various ecological, demographic, and policy-relevant attributes of individual central cities.

One recent study, which purports to isolate the determinants of central city flight by class, estimates residential-location equations for poor and middle-income families on the basis of the 1960 patterns of 87 metropolitan areas (Bradford and Kelejian, 1973). The findings of this study, according to the authors, support the postulate of a feedback relationship, since the "residential location decisions" of middle- and upper-class households are determined heavily by city-suburb rent

and fiscal surplus differentials, and by the location of poor families in the central core. These findings, however, are drawn from locational data for the static--rather than mobile--metropolitan populations, and any link to mobility decision-making would appear to be tenuous. Schnore and Winsborough (1972) have also performed a multivariate causal analysis of 1960 city-suburb social class differentiation in 200 urbanized areas. Their findings, based largely on an evaluation of structural metropolitan attributes, indicate that the status of central city residents is lower in older, Northeast metropolitan areas that are characterized by a high degree of manufacturing employment.

To our knowledge, the only causal analysis of a migration component leading to central city compositional change has been undertaken by Pack (1973). Her analysis of 20 cities for the 1955-60 period focuses on in-migration rather than the more policy-relevant city-to-suburb stream, and race-specific (white-nonwhite) migration patterns are interpreted as if they were class-specific responses. Not surprisingly, in-migration is strongly related to the city's labor force attributes for both classes of movers; however, white in-migration is also influenced by city fiscal variables--educational expenditures, taxes, and welfare expenditures.

The present study is concerned with evaluating demographic and policy-relevant attributes of central cities that have been suggested as determinants of class-specific, white, city-to-suburb movement. The multivariate analysis employs migration data from the 1970 census for 39 large SMSAs with populations of one-half million or more.[1] In addition, a demographic decomposition technique is utilized to estimate the aggregate impact of flight for the city's class composition, and changes in

that impact that might be associated with hypothetical city or metropolitan conditions. This study of class-specific flight is an extension of our earlier work on the causes of white flight in the aggregate (Frey, 1977b) and provides a more refined analysis of the determinants of selective out-movement from the city.

The questions to be addressed are:

(1) How has white city-to-suburb movement affected the social compositions of large central cities during the 1967-70 period?

(2) Which demographic and policy-alterable attributes of a metropolitan area determine suburbanward movement for city whites at each status level?

(3) How would changes in city-suburb fiscal disparities, the city crime rate, and racial composition affect suburbanward movement and population change in specific central cities?

The study's sole focus on the city-to-suburb movement stream is intentional. Although we are mindful of the fact that population change is the net of various movement streams in addition to natural increase, the emphasis on this single stream is consistent with policymakers' concerns over further outmovement of the existing city population.

2. Class-Specific Flight and the Social Compositions of Cities

While it is well documented that white city-to-suburb movers are, on the whole, higher in status than nonmigrating city whites (Taeuber and Taeuber, 1964; Farley, 1976), individual cities differ with regard to the consequences that white flight imposes on their social compositions.

Data from the 1970 census (U.S. Bureau of the Census, 1973a) allow us to calculate the impact of the 1965-70 white city-to-suburb stream for the compositions of specific central cities, if we are willing to confine our attention to the white (nonblack) population aged 25 and over, and to delineate social composition on the basis of six classes of years of school completed.

Conceptually, the 1970 white city population of an education class, (i), can be related to the corresponding 1965 population, and various movement streams as follows:[2]

$$\begin{aligned}\text{1970 White City Population (i)} = \\ &\text{1965 White City Population (i)} \\ &- \text{1965-70 White City-Outside SMSA Migrants (i)} \\ &- \text{1965-70 White City-Suburb Movers (i)} \\ &+ \text{1965-70 White Outside SMSA-City Migrants (i)} \\ &+ \text{1965-70 White Suburb-City Movers (i)}\end{aligned} \qquad (1)$$

where "i" equals one of six education classes. The percentage change in the city's 1970 population (i) that would occur in the absence of 1965-70 city-to-suburb movement can then be calculated as:

$$\frac{\text{1965-70 white city-suburb movers (i)}}{\text{1970 white city population (i)}} \times 100 \qquad (2)$$

Population figures and percentage change for Detroit, Buffalo, Hartford, Dallas, Atlanta, and Sacramento, as well as means for all 39 SMSAs, appear in Table 1. (See Appendix 1 for a discussion of how census tabulations are employed to estimate the migration measures.)

It is clear from the data presented that white city-to-suburb movement in the late 1960s is still fairly selective in character. However, according to the means and standard deviations for the 39 SMSAs, the flight impact on central city composition varies widely across metropolitan

Table 1: Percentage Change in 1970 White City Population that would have resulted from the absence of White City-to-Suburb Movement in Selected SMSAs.

Years of School Completed	1970 White City Population (1)	1965-70 White City-to-Suburb Movement (2)	% Change in the 1970 White City Population That Would Occur in the Absence of City-to-Suburb Movement[a] (3)
Detroit			
Elem: Under 8	92,015	14,627	15.9%
Elem: 8	77,633	12,757	16.4
H.S.: 1-3	119,495	25,941	21.7
H.S.: 4	153,878	49,022	31.9
Coll: 1-3	42,603	16,508	38.8
Coll: 4+	39,841	17,007	42.7
Buffalo			
Elem: Under 8	38,732	3,444	8.9
Elem: 8	37,639	3,760	10.0
H.S.: 1-3	53,439	7,689	14.4
H.S.: 4	56,594	14,119	25.0
Coll: 1-3	16,926	5,017	29.6
Coll: 4+	16,603	4,761	28.7
Hartford			
Elem: Under 8	15,895	2,092	13.2
Elem: 8	9,981	1,851	18.6
H.S.: 1-3	13,091	2,900	22.2
H.S.: 4	17,069	5,622	32.9
Coll: 1-3	5,229	1,717	32.8
Coll: 4+	5,543	1,782	32.2
Dallas			
Elem: Under 8	47,867	3,740	7.8
Elem: 8	23,778	2,505	10.5
H.S.: 1-3	77,651	7,633	9.8
H.S.: 4	97,125	11,298	11.6
Coll: 1-3	54,983	5,756	10.5
Coll: 4+	59,322	5,616	9.5
Atlanta			
Elem: Under 8	22,673	4,634	20.4
Elem: 8	10,427	2,456	23.6
H.S.: 1-3	30,508	8,999	29.1
H.S.: 4	34,480	14,166	41.1
Coll: 1-3	22,054	7,763	35.2
Coll: 4+	26,369	6,910	26.2
Sacramento			
Elem: Under 8	16,472	1,685	10.2
Elem: 8	13,363	1,492	11.2
H.S.: 1-3	22,857	4,819	21.2
H.S.: 4	43,100	10,062	23.4
Coll: 1-3	20,232	5,247	25.9
Coll: 4+	15,210	3,692	24.3
Means - 39 SMSAs[b]			
Elem: Under 8			9.5 (4.6)
Elem: 8			10.9 (5.2)
H.S.: 1-3			14.8 (7.0)
H.S.: 4			20.2 (10.5)
Coll: 1-3			21.6 (11.9)
Coll: 4+			21.0 (12.9)

[a] Computed as: $\frac{\text{column (2) total} \times 100}{\text{column (1) total}}$

[b] Standard deviations appear in parentheses.

areas--particularly with respect to the city's highly educated population. The most consistent pattern of class-selective redistribution occurs within older, Northern SMSAs. The aggregate effects of city-to-suburb movement in Detroit, Buffalo, and Hartford were most devastating for the college-educated populations in their central cities (accounting for 30-40 percent of their populations), and far less imposing for the least educated classes. These patterns typify the experiences of other older Northern SMSAs in the study.

The consequences of white flight for Southern cities, Dallas and Atlanta, stand somewhat in contrast to those just reviewed. The Dallas pattern is particularly unique. Suburbanward movement from its central city affects all six education classes to a similar degree. In Atlanta, white out-migration exerts its greatest impact on the city's high school graduate population while the impact on college graduates is much less. This pattern characterizes a number of other Southern cities in the study. Finally, white out-movement in Sacramento reduces the magnitudes of the city's high school and college-educated residents to a similar extent. This reduction is moderated for the grade-school-educated city population.

Our examination of flight consequences for the social compositions of individual cities suggests that: (a) city-to-suburb flight in the 1965-70 period is still status-selective and serves to reduce the numbers of more highly educated city residents; (b) the most consistent patterns of status-selective redistribution seem to occur in central cities of older, Northern metropolitan areas; and (c) the impact of white flight on the central city's college-educated population varies widely among SMSAs. The analyses that follow examine more specifically the determinants

of upper-status flight and contrast these with flight determinants at other status levels.

3. Determinants of Class-Specific Flight

Suburban Propensity Rates for White City Movers

Analysis of the determinants of class-specific flight focuses on one element in the city-to-suburb movement process--the suburban propensity rates for white city movers. This rate relates directly to the number of 1965-70 white city-suburb movers in education class (i) if one assumes, first, that

$$\begin{matrix}\text{White City-Suburb} \\ \text{Movers (i)}\end{matrix} = \begin{matrix}\text{White City Residents (i)} \\ \text{at-risk to Move}\end{matrix} \times \begin{matrix}\text{City-Suburb Stream Mobility Rate} \\ \text{among White City Residents (i)}\end{matrix} \qquad (3)$$

and second, that the city-suburb stream mobility rate can be defined as the product of two component rates:

$$\begin{matrix}\text{City-Suburb Stream Mobility Rate} \\ \text{among White City Residents (i)}\end{matrix} = \begin{matrix}\text{Mobility Incidence Rate} \\ \text{among White City Residents (i)}\end{matrix} \times \begin{matrix}\text{Suburban Propensity Rate} \\ \text{among White City Movers (i)}\end{matrix} \qquad (4)$$

where:

$$\begin{matrix}\text{Mobility Incidence Rate} \\ \text{among White City Residents (i)}\end{matrix} = \frac{\begin{matrix}\text{White City Movers (i)} \\ \text{to any location within the metropolitan area}\end{matrix}}{\begin{matrix}\text{White City Residents (i)} \\ \text{at-risk to Move}\end{matrix}}$$

$$\begin{matrix}\text{Suburban Propensity Rate} \\ \text{among White City Movers (i)}\end{matrix} = \frac{\text{White City-Suburb Movers (i)}}{\begin{matrix}\text{White City Movers (i)} \\ \text{to any location within the metropolitan area}\end{matrix}}$$

The utility of decomposing the city-suburb stream rate into the component mobility incidence and suburban propensity rates has been discussed

in detail elsewhere (Frey, 1978). Put simply, these components can be viewed as the aggregate analogs of the two stages in the process of residential mobility: (1) the decision to move on the part of the resident; and (2) the choice of destination on the part of the mover. This analytic distinction has been made in earlier studies, which found that the mobility decision per se is usually motivated by housing adjustments related to the life cycle (Rossi, 1955; Butler et al., 1969; Speare, Goldstein, and Frey, 1975). The choice of destination location, however, involves the comparison of amenities and disamenities associated with different prospective communities. Previous work by the author demonstrates that it is this latter choice--among movers in the aggregate--which most directly affects the level of central city white flight.[3] For this reason, the suburban propensity rate constitutes the focus of the present analysis.

In Figure 1, we present 1965-70 suburban propensity rates among white city movers of each education class, for the six SMSAs that were discussed above. It is apparent that the education-specific suburban propensity rates of each city's movers closely parallel its education-specific pattern of aggregate population change (shown in Table 1).

Multivariate Analysis of Suburban Propensity

We turn now to our causal analysis of suburban propensity rates by education class in order to isolate--in separate regression models--city and metropolitan attributes that are associated with white out-movement at different status levels. The multivariate analyses performed here are concerned with two general types of causal factors. The first of

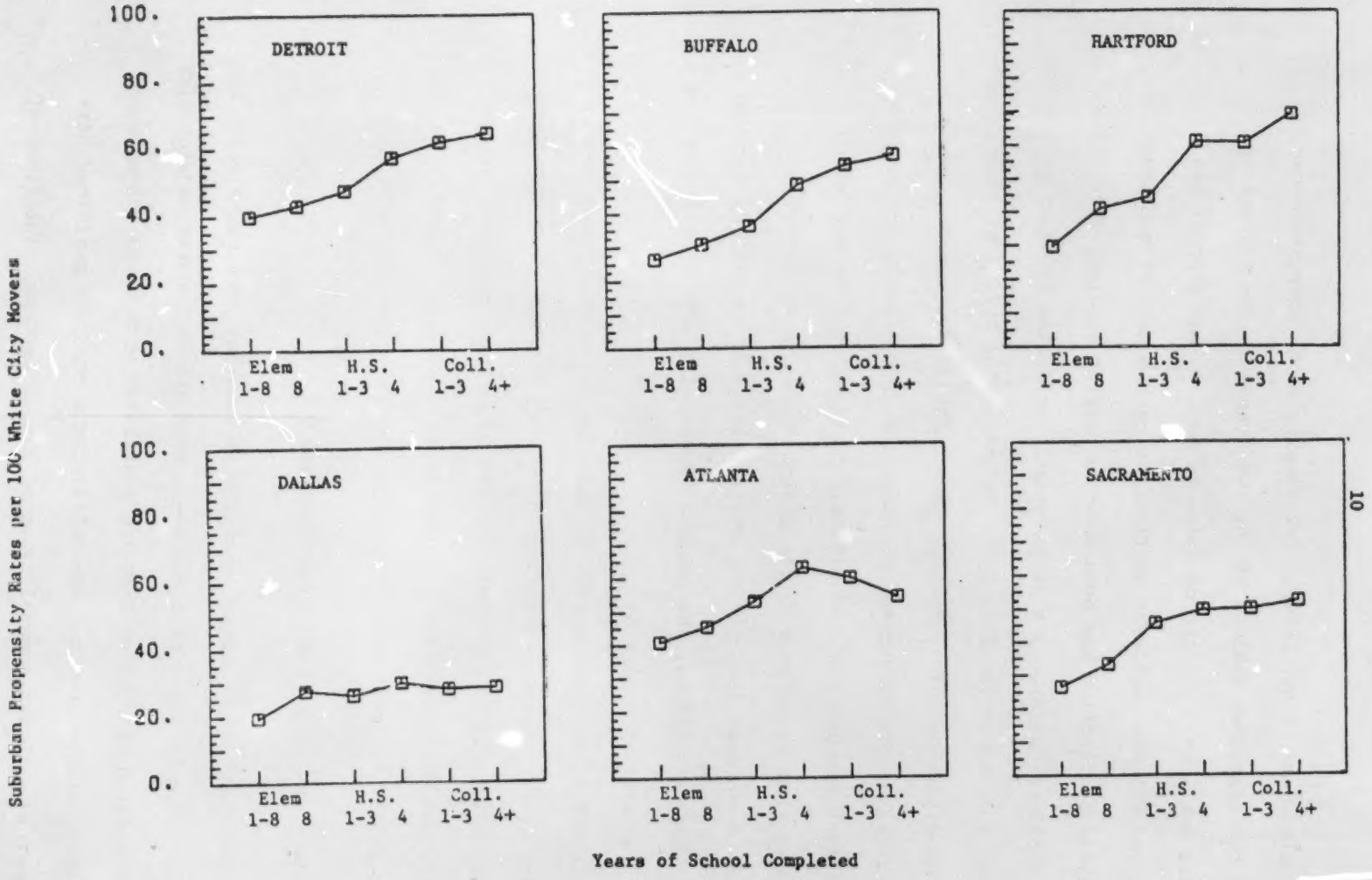

Figure 1: 1965-70 Education-specific Suburban Propensity Rates for White City Movers Aged 25 and Over, in Selected SMSAs.

these is made up of three metropolitan attributes that serve as "controls" for the underlying demographic and growth structure of the area. They are:

1. City Share of SMSA Population. This is the percentage of SMSA population which resides in the city (U.S. Bureau of the Census, 1973c).
2. Recent Suburban Development. This is the percentage of 1970 suburban year-round units in structures built since 1950 (U.S. Bureau of the Census, 1973b).
3. Central City Age. The number of years between the census year when the city first attained a population of 50,000 and the year 1970 (U.S. Bureau of the Census, 1973c).

The City Share of the SMSA Population measures the relative number of potential suburb-city destinations that are available to movers within the metropolitan area. There exists a strong negative relationship between this factor and the suburban propensity of city-origin movers. Recent Suburban Development, the second demographic structure factor, differentiates metropolitan areas according to the recency of their suburban population growth. SMSAs ranking high on this factor tend to be similar in other structural features as well (i.e., they are usually newer, lower in population density, and located primarily in the South and West). Our previous investigations of white city-suburb redistribution, in the aggregate, suggest that SMSAs with recent histories of suburban growth continue to experience high levels of suburbanward relocation among movers. The third demographic structure factor, Central City Age, has been a standard control in comparative metropolitan studies

of city-suburb differentiation and redistribution. According to this research, it is expected that older SMSAs will experience greater levels of suburbanward relocation when the other structural features are taken into account.

The second set of city and metropolitan attributes is designated as "policy-relevant" because some have become the focus of public debates, and the status of most of them in a particular metropolitan area can be altered through implementation of public policies.

1. The Suburb/City Per Capita Educational Expenditures represents the ratio of 1970 suburban educational expenditures per capita to 1970 central city educational expenditures per capita (x 100). (Advisory Commission on Intergovernmental Relations, 1973.)
2. The Suburb/City Per Capita Tax Revenues represents the ratio of 1970 suburban tax revenues per capita to 1970 central city tax revenues per capita (x 100). (Advisory Commission on Intergovernmental Relations, 1973.)
3. The City Crime Rate represents the number of serious crimes reported in 1970 per 1000 central city population, 1970. Serious crimes include murder, rape, robbery, aggravated assault, burglary, larceny, and auto theft (U.S. Bureau of the Census, 1973b).
4. City-Suburb Commuters are the percentage of 1970 central city residents reporting a place of work who report a suburban workplace (U.S. Bureau of the Census, 1973c).

5. Percent City Black is the percentage of total 1965 population which was black (U.S. Bureau of the Census, 1973b). Totals for 1965 were averaged from 1960 and 1970 totals.

The first two of these represent the degree of fiscal disparity between the city and its suburbs which may trigger the suggested feedback relationship between fiscal decline and white suburban movement. The City Crime Rate, largely a function of a city's population composition, may also be affected by a reallocation of local expenditures. The factor, City-Suburb Commuters, is an indicator of the recent suburbanization of employment. It is hypothesized that suburban employment growth will exert an independent effect on suburbanward residential relocation. Finally, we examine the impact that a city's racial composition exerts on the white suburban propensity rate. Although the implementation of public policies may not change existing compositions to a great extent, Kain and Persky (1969) argue that the concentration of blacks in a city exacerbates the out-movement of white residences and businesses, and that proposed "ghetto enrichment" programs would only serve to increase that concentration through black in-migration.

In our earlier study of aggregate white flight we found that the importance of the city's racial composition was moderated in Southern cities (Frey, 1977a). Therefore, we include a Southern Region dummy variable and an interaction term (City Black x Southern Region) in order to capture this differential effect.

6. Southern Region: A dummy variable which indicates a city's location in the Southern Region as defined by the Census

Bureau; Southern Region cities = 1, Other cities = 0. (U.S. Bureau of the Census, 1973b.)

7. City Black x Southern Region: An interaction term which denotes the value of Percent City Black for cities in the Southern Region, and a 0.0 value for all other cities.

In this investigation we are particularly interested in isolating policy-relevant attributes that influence the suburban propensities of college-educated movers. The retention of this subpopulation is crucial to the city's existence and, as was observed in Table 1, their out-migration varies widely from city to city. Pack (1973) found upper-status in-migrants to be more positively responsive to educational expenditures and more negatively responsive to per capita taxes and welfare expenditures than were lower-status migrants. The Bradford and Kelejian (1973) "flight" model found that when residence location equations were estimated for more selective upper-class populations, avoidance of the central city's poor became stronger. One might expect a similar class-specific effect with regard to the avoidance of blacks (although Bradford and Kelejian found city racial composition to be of negligible importance in estimating their equations).

The results of our multivariate analysis appear as six regression equations in the upper portion of Table 2. Here, suburban propensity rates for white movers at each education level were regressed on the demographic and policy-relevant attributes discussed above. In interpreting the relative effects of these attributes within an education class the standardized regression coefficients in the lower portion of the table are emphasized. The findings indicate that in nonSouthern SMSAs, the

Table 2: 1965-70 Education-specific Suburban Propensity Rates for White City Movers Aged 25 and over, regressed on City and Metropolitan attributes, in 39 SMSAs.

Regression Equations for Suburban Propensity of White City Movers

City and Metropolitan Attributes	Years of School Completed: Elementary, Under 8 (1)	Elementary, 8 (2)	High School, 1-3 (3)	High School, 4 (4)	College, 1-3 (5)	College, 4+ (6)
Partial Regression Coefficients:						
City Share of SMSA Population	-.0036*	-.0050*	-.0067*	-.0082*	-.0087*	-.0092*
Recent Suburban Development	.0012*	.0021*	.0037*	.0040*	.0035*	.0026*
Central City Age	-.0001	.0001	.0004*	.0008*	.0009*	.0006
Suburb/City per Capita Ed Exp.	.0004	.0000	.0004	.0006*	.0011*	.0014*
Suburb/City per Capita Taxes	-.0012*	-.0004	-.0006	-.0011*	-.0011	-.0005
City Crime Rate	.0006	.0005	.0005	.0003	.0002	.0009
City-Suburb Commuters	.0039*	.0036*	.0030*	.0033*	.0033	.0034
Percent City Black	.0016*	.0020*	.0019*	.0035*	.0042*	.0050*
Southern Region	.0267	.0630	.0391	.0563	.0448	.0353
City Black x Southern Reg.	.0003	-.0008	.0000	-.0012	-.0021	-.0027
Intercept	.2356	.2695	.2564	.3300	.3309	.3291
R^2	.79	.82	.85	.85	.84	.79
Standardized Regression Coefficients:						
City Share of SMSA Population	-.569	-.680	-.782	-.786	-.787	-.737
Recent Suburban Development	.196	.290	.444	.395	.327	.215
Central City Age	-.029	.040	.095	.166	.185	.101
Suburb/City per Capita Ed Exp.	.145	.004	.085	.122	.201	.225
Suburb/City per Capita Taxes	-.226	-.070	-.081	-.129	-.121	-.048
City Crime Rate	.104	.076	.068	.034	.021	.078
City-Suburb Commuters	.330	.258	.185	.166	.158	.144
Percent City Black	.223	.251	.196	.300	.343	.363
Southern Region	.142	.288	.153	.180	.136	.095
City Black x Southern Reg.	.055	-.128	-.005	-.134	-.217	-.247

* Denotes coefficient which is greater than twice the value of its standard error.

city's racial composition exerts its greatest influence on the suburban relocation of college-educated movers. Indeed, among the college-educated, the percentage of the city that is black appears to be a more important flight determinant than any of the other policy-relevant factors. The suburbanward movement of this upper-status subgroup is also responsive to suburb-city disparities in educational expenditures. Less impressive flight effects can be attributed to suburban employment growth, suburb-city tax disparities, and the city crime rate.

At the other end of the status spectrum, a somewhat different array of flight determinants appears to be operating, Individuals with less than an eighth-grade education are most apt to choose a suburban destination within SMSAs that have experienced recent suburban employment growth. The effect of the city's racial composition appears to be less important for this group. For this group, also, the suburb-city tax differential exerts a greater impact on suburban relocation than the suburb-city differential in educational expenditures.

In sum, our findings indicate that: (a) upper-status white flight is responsive to the central city's racial composition, although this effect is moderated in Southern cities; (b) there exists, to some degree, a feedback relationship between suburb-city disparities in public expenditures (specifically, education expenditures) and upper-status flight; and (c) that both of these explanations are more important in accounting for the out-movement of a city's college-educated population than for the out-movement of other education classes.

4. The Impact of Flight Determinants for Individual Cities

The regression results in Table 2 provide a useful overview of flight effects associated with the various policy-relevant attributes. They do not, however, allow us to assess, for individual cities, either the aggregate impact each attribute exerts on the total number of city-to-suburb movers, or the aggregate impact each attribute exerts on the total size of the city population, by education class. These aggregate effects, of course, differ across cities because each SMSA embodies a different combination of demographic and policy-relevant attributes. For example, the city's racial composition should account for a larger proportion of upper-class flight in Newark (where Percent City Black is 44) than would be the case in Denver (where it is 8).

Utilizing the regression equations in the upper portion of Table 2 to estimate class-specific destination propensity rates, it is possible to calculate the aggregate effects that particular policy-relevant attributes impose on individual cities. More specifically, we are able to compare levels of 1965-70 city-to-suburb movement that occur when an SMSA retains its <u>actual</u> attributes with those that would result under <u>hypothetical</u> conditions. The hypothetical conditions (and associated attribute values) to be employed in the present analysis are as follows:

A. Equal per capita educational expenditures in the central city and suburbs (hypothetical suburb/city per capita educational expenditures = 100)

B. Equal per capita tax revenues in the central city and suburbs (hypothetical suburb/city per capita tax revenues = 100)

C. Reduction in city crime rate by one-half (hypothetical city crime rate = one-half actual city crime rate)

D. Reduction in the percentage of the city's black population by one-third (hypothetical percent city black = two-thirds actual percent city black)

According to the regression equations, each of the hypothetical conditions should serve to decrease white city-to-suburb movement and to increase the central city white population for most SMSAs. Moreover, the effects associated with conditions A and D should be magnified for the college-educated subgroups.

The "reasonableness" of assuming equal suburb-city education expenditures, or equal suburb-city taxes per capita, will vary with individual SMSAs, depending on how far these hypothetical conditions depart from actual conditions, and on the practicality of achieving such a situation given the existing structure of overlapping governmental responsibilities. Less credible are the hypothetical values we attribute to each city's crime rate and racial composition. It is unlikely that any set of forces could effect the short-term changes in a city's racial composition which are assumed. These hypothetical values, therefore, represent rather extreme conditions, and the aggregate flight effects associated with them should be interpreted with this in mind.

Aggregate effects will be estimated for the six metropolitan areas discussed above. As the data in Table 3 indicate, these SMSAs differ with respect to their actual values for the fiscal disparity measures, the city crime rate, and percentage of the city that is black. Of the six, Detroit's attributes seem to be most conducive to upper-status

Table 3: City and Metropolitan Attributes for Selected SMSAs

SMSAs	Attributes			
	Suburb/City Per Capita Ed Exp (1)	Suburb/City Per Capita Taxes (2)	City Crime Rate (3)	Percent City Black (4)
Detroit	148	82	84	40
Buffalo	158	101	40	17
Hartford	103	69	59	22
Dallas	110	51	60	22
Atlanta	88	48	55	45
Sacramento	123	82	46	9
Mean - 39 SMSAs	120	76	50	22
(SD)	(28)	(17)	(16)	(12)

flight. Its suburb-city disparity in per capita education expenditures, and its city percentage of blacks are well above the means for the 39 SMSAs in the study. Buffalo's suburb-city educational expenditure ratio is greater than that of Detroit; however its other attributes are less likely to instigate white out-movement. Of the three Northern SMSAs, Hartford's attribute values are the least flight-related.

Southern metropolitan areas, Dallas and Atlanta, show fairly large suburb-city disparities in per capita tax revenues. City and Suburb per capita educational expenditures, however, are more coincident in each of these cities. (Per capita expenditures in Atlanta's central city are greater than those in its suburbs.) Finally, Sacramento's values on all four policy-relevant attributes--like those of Hartford--do not appear to be conducive to white suburban relocation. Of the six SMSAs examined, its percentage of city blacks is the lowest.

The aggregate redistribution effects for a given SMSA associated with hypothetical conditions A through D will be assessed through two measures: the percent change in white city-suburb movers in each education class (i), and percent change in the white city population in each education class (i). The first is defined as:

$$\frac{(\text{1965-70 white city-suburb movers (i)}^{**} - \text{1965-70 white city-suburb movers (i)}^{*})}{(\text{1965-70 white city-suburb movers (i)}^{*})} \times 100$$

where:

1965-70 white city-suburb movers (i)** is computed from relationships (3) and (4) where the suburban propensity rate (i) in relationship (4) is estimated from the appropriate regression equation in Table 2 based on hypothetical attributes assumed in A, B, C, or D.

1965-70 white city-suburb movers (i)* is computed from relationships (3) and (4) where the Suburban Propensity Rate (i) in relationship (4) is estimated from the appropriate regression equation in Table 2 based on the SMSA's actual attributes (in Table 3).

The second measure is defined as:

$$\frac{(\text{1970 white city population (i)}^{**} - \text{1970 white city population (i)}^{*})}{(\text{1970 white city population(i)}^{*})} \times 100$$

where:

1970 white city population (i)** is computed from relationship (1) based on the value for 1965-70 white city-suburb movers (i)** as defined above.

1970 white city population (i)* is computed from relationship (1) based on the value for 1965-70 white city-suburb movers (i)* as defined above.

The data in Table 4 indicate the aggregate effects imposed by each hypothetical condition on the six metropolitan areas. Columns (1) through (4) show the assumed percentage change in the number of white 1965-70 city-suburb movers, and columns (5) through (8) display the corresponding percentage change in the size of the 1970 white city population. As expected, the imposed conditions tend to reduce the volume of city-suburb movement and increase the white population in the central city.

Although no attempt will be made to describe all the data presented, two general observations might be noted. First, the aggregate effects presented in columns (1), (4), (5) and (8) confirm our interpretation of

Table 4: Estimated Changes in 1965-70 White City-to-Suburb Movement and in the 1970 White City Population Aged 25 and Over, resulting from hypothetical city and metropolitan attributes in Selected SMSAs.

Years of School Completed	% Change in 1965-70 White City-to-Suburb Movement Resulting from: Equal Suburb/City Per Capita Ed. Expen. (1)	Equal Suburb/City Per Capita Taxes (2)	One-half Reduction in City Crime Rate (3)	One-third Reduction in % City Black (4)	% Change in the 1970 White City Population Resulting from: Equal Suburb/City Per Capita Ed. Expen. (5)	Equal Suburb/City Per Capita Taxes (6)	One-half Reduction in City Crime Rate (7)	One-third Reduction in % City Black (8)
Detroit								
Elem: Under 8	- 5.8	- 5.7	-6.6	-5.1	+ .8	+ .8	+ .1	+ .7
Elem: 8	- .1	- 1.8	-5.0	-5.9	0.0	+ .3	+ .8	+ .9
H.S.: 1-3	- 3.5	- 2.1	-4.6	-4.7	+ .8	+ .5	+1.0	+1.0
H.S.: 4	- 4.9	- 3.3	-2.2	-7.0	+1.6	+1.1	+ .7	+2.3
Coll: 1-3	- 8.0	- 3.0	-1.4	-7.8	+3.2	+1.2	+ .6	+3.2
Coll: 4+	- 9.1	- 1.2	-5.1	-8.5	+4.4	+ .6	+2.5	+4.1
Buffalo								
Elem: Under 8	-10.0	+ .4	-4.4	-3.4	+ .9	- .3	+ .4	+ .3
Elem: 8	- .2	+ .1	-3.2	-3.7	0.0	0.0	+ .3	+ .4
H.S.: 1-3	- 5.8	+ .1	-2.8	-2.9	+ .8	0.0	+ .4	+ .4
H.S.: 4	- 8.0	+ .2	-1.4	-4.3	+1.8	- .1	+ .3	+1.0
Coll: 1-3	-12.5	+ .2	- .8	-4.6	+3.3	- .1	+ .2	+1.2
Coll: 4+	-14.4	+ .1	-3.1	-5.1	+3.9	0.0	+ .8	+1.4
Hartford								
Elem: Under 8	- .4	-10.2	-4.8	-3.2	+ .1	+1.6	+ .8	+ .5
Elem: 8	0.0	- 3.1	-3.5	-3.5	0.0	+ .6	+ .7	+ .7
H.S.: 1-3	- .2	- 3.6	-3.2	-2.8	+ .1	+ .9	+ .8	+ .7
H.S.: 4	- .3	- 5.8	-1.6	-4.3	+ .8	+1.8	+ .5	+1.3
Coll: 1-3	- .1	- 5.5	-1.0	-4.9	+ .2	+1.8	+ .3	+1.6
Coll: 4+	- .6	- 2.3	-3.9	-5.6	+ .2	+ .7	+1.1	+1.6
Dallas								
Elem: Under 8	- 1.8	-23.5	-6.9	-5.6	+ .2	+2.3	+ .7	+ .6
Elem: 8	0.0	- 7.5	-5.3	-3.2	0.0	+ .8	+ .6	+ .3
H.S.: 1-3	- 1.1	- 9.0	-4.9	-4.3	+ .1	+1.1	+ .6	+ .5
H.S.: 4	- 1.7	-15.1	-2.6	-4.5	+ .2	+2.2	+ .4	+ .7
Coll: 1-3	- 3.1	-16.0	-1.9	-4.5	+ .4	+2.1	+ .2	+ .6
Coll: 4+	- 4.2	- 7.5	-7.9	-5.3	+ .5	+ .8	+ .9	+ .6

Table 4 - Continued

Years of School Completed	% Change in 1965-70 White City-to-Suburb Movement Resulting from: Equal Suburb/City Per Capita Ed. Expen. (1)	Equal Suburb/City Per Capita Taxes (2)	One-half Reduction in City Crime Rate (3)	One-third Reduction in % City Black (4)	% Change in the 1970 White City Population Resulting from: Equal Suburb/City Per Capita Ed. Expen. (5)	Equal Suburb/City Per Capita Taxes (6)	One-half Reduction in City Crime Rate (7)	One-third Reduction in % City Black (8)
Atlanta								
Elem: Under 8	+1.4	-15.8	-4.1	-7.2	- .3	+2.9	+ .8	+1.4
Elem: 8	0.0	- 5.0	-3.1	-4.1	0.0	+1.1	+ .7	+ .1
H.S.: 1-3	+ .8	- 5.7	-2.7	-5.2	- .2	+1.6	+ .8	+1.5
H.S.: 4	+1.2	- 9.4	-1.4	-5.4	- .5	+3.7	+ .6	+2.1
Coll: 1-3	+2.3	- 9.8	-1.0	-5.3	- .8	+3.3	+ .3	+1.8
Coll: 4+	+3.0	- 4.6	-4.2	-6.1	- .8	+1.2	+1.1	+1.6
Sacramento								
Elem: Under 8	-3.6	- 7.6	-4.7	-1.7	+ .4	+ .8	+ .5	+ .2
Elem: 8	- .1	- 2.2	-3.2	-1.7	0.0	+ .3	+ .4	+ .2
H.S.: 1-3	-1.8	- 2.3	-2.7	-1.2	+ .4	+ .5	+ .5	+ .3
H.S.: 4	-2.7	- 3.9	-1.4	-2.0	+ .7	+1.0	+ .3	+ .5
Coll: 1-3	-4.6	- 3.8	- .9	-2.4	+1.3	+1.0	+ .3	+ .7
Coll: 4+	-5.6	- 1.6	-3.6	-2.7	+1.4	+ .4	+ .9	+ .7
Means - 39 SMSAs								
Elem: Under 8	-4.9	-11.3	-6.3	-5.2	+ .3	+1.1	+ .5	+ .5
Elem: 8	- .1	- 3.5	-4.5	-4.5	0.0	+ .4	+ .5	+ .5
H.S.: 1-3	-2.8	- 4.1	-4.1	-4.3	+ .3	+ .6	+ .5	+ .6
H.S.: 4	-4.0	- 6.5	-2.0	-5.6	+ .5	+1.3	+ .4	+1.0
Coll: 1-3	-6.5	- 6.4	-1.3	-5.9	+ .9	+1.3	+ .3	+1.2
Coll: 4+	-7.9	- 2.9	-5.3	-6.7	+1.1	+ .5	+1.0	+1.3

the regression coefficients in Table 2. Namely, that suburb-city disparities in educational expenditures and the city's racial composition exert a disproportionate influence on the suburban relocation of the central city's upper-status white population. These effects with respect to educational expenditures are particularly evident for Detroit and Buffalo--SMSAs in which actual suburb-city disparities deviate markedly from parity. The aggregate impact of this factor is less impressive in Hartford, Dallas, Atlanta, and Sacramento. In these SMSAs, city and suburban per capita educational expenditures are more coincident.

Second, although the directions of city-suburb flight effects across status levels are consistent with those discussed earlier, the magnitudes on aggregate city population change are surprisingly small. As an example, the data in Table 1 show that the white 1965-70 city-to-suburb movement stream represented 42.7 percent of the 1970 city college graduate population in Detroit. However, under none of the hypothetical situations imposed in the Table 4 analysis would the size of Detroit's city-to-suburb stream be reduced as much as 10 percent, or the size of its city college graduate population be increased by as much as 5 percent. The aggregate effects are even less imposing for other education classes, and in most other SMSAs. These findings underscore the importance of focusing on the mobile rather than the static population in a study of community compositional change. They also suggest that the demographic consequences of various policy-relevant attributes are fairly minimal in the short run.

5. Summary

The findings presented here utilize migration data from the 1970 census to address issues which have not been investigated in previous research on central city flight. These include: (1) evaluating the aggregate impact that white city-to-suburb movement imposes on the social compositions of large central cities; (2) isolating the demographic and policy-relevant flight determinants for white movers at different status levels; and (3) estimating the aggregate impact that policy-relevant attributes impose on the population compositions of individual central cities as a result of city-to-suburb movement.

We find that white flight in the late 1960's is still selective with regard to social status, and that suburbanward out-movement can account for a substantial percentage of a city's college-educated population. The magnitude of this out-movement varies widely across SMSAs and greatest losses are imposed on older, Northern, central city populations. We also find that upper-status flight occurs to a greater degree in central cities with large black populations and in metropolitan areas wherein suburban per capita educational expenditures exceed those in the central city. This latter finding lends partial support to the hypothesis that a feedback relationship exists between suburb-city fiscal disparities and upper-status flight.

In the final portion of the analysis, we estimated the aggregate impact for white city-to-suburb movement and the city's social composition that would be associated with: equalizing suburb-city fiscal disparities, lowering the city crime rate, and reducing the percentage

of the city's black population. In none of these situations do we find a substantial reduction in city-to-suburb movement levels or significant increases in the city's upper status population. These findings strongly indicate that policy-alterable attributes can effect only minimal changes in the magnitude and character of white suburbanward relocation over a short-run five-year migration interval.

APPENDIX 1

Use of Census Data to Estimate Migration Measures

The data used to estimate the migration measures in the study are taken from the Mobility for Metropolitan Areas census subject report (U.S. Bureau of the Census, 1973) which crosstabulates the 1970 city and suburb residents of an SMSA by their reported 1965 location--city, suburb, or outside metropolitan areas. The tabulations employed in this study pertain to white (nonblack) individuals aged 25 and over in each of six education classes (categorized by years of school completed as of 1970).

There are inherent disadvantages to using the "residence 5 years ago" census question for making inferences about migration over the interval. First, a comparison of 1965 residence with 1970 residence does not allow identification of multiple or return moves. Second, the 1965 place of residence is based on the individual's recall of residence location, and may be subject to error. Third, the 1965 residence status for a significant minority of individuals was classed as "moved but previous residence not reported or abroad." Because most of these individuals fell into the "not reported" rather than the "abroad" category, such persons were allocated into other categories of movers, according to the distribution of previous locations given by those who did report their 1965 residences.

Given these limitations of the census data, which all prior research has been forced to tolerate, the values required to compute the migration measures in this study can be estimated as follows:

1970 white city population (i) -- 1970 white city residents in education class (i) reporting 1965 residence:

in the same city dwelling unit;
in a different city dwelling unit;
in the suburbs of the same SMSA;
outside of the SMSA.

1965-70 white city-suburb movers (i) -- 1970 white suburb residents in education class (i) reporting 1965 residence:

in the city of the same SMSA.

1965-70 white city movers (i) (to any location within the metropolitan area) -- 1970 white city residents in education class (i) reporting 1965 residence:

in a different city dwelling unit.

+ 1970 white suburb residents in education class (i) reporting 1965 residence:

in the city of the same SMSA.

1965 white city residents (i) at-risk to move -- 1970 white city residents in education class (i) reporting 1965 residence:

in the same city dwelling unit;
in a different city dwelling unit;

+ 1970 white suburb residents in education class (i) reporting 1965 residence:

in the city of the same SMSA.

The migration measures and relationships in text expressions (1), (3), and (4) as well as their estimation with census data discussed here constitute a special case of the more general migration analysis framework presented in Frey (1978).

NOTES

[1]The 1970 U.S. Census special subject report, Mobility for Metropolitan Areas (U.S. Bureau of the Census, 1973a) tabulates the 1970 city and suburban locations of metropolitan residents in each of the 65 largest SMSAs by their reported 1965 city and suburb locations. From these tabulations, it is possible to calculate the 1965-70 migration measures and rates utilized in the analyses that follow. Individuals in a residual category, who moved but did not report a 1965 place of residence or who were abroad in 1965 (the former making up most of the category) were allocated to 1965 residences according to the distributions of individuals who did report a 1965 place of residence.

The 39 SMSAs in the present study include only those of the largest 65, which have a mononuclear city and were not excluded because of one of the following: (a) a large proportion of the male labor force was in the armed forces in 1970; (b) sufficient migration or community attribute information was unavailable; or (c) extensive boundary changes took place between 1965-70.

[2]The population and migrant subgroups identified on the right-hand side of equation (1) identify individuals who have survived until 1970; hence, a mortality component is not included in the equation. There is also no need to include a fertility component since the equation pertains only to individuals aged 25 and over in 1970 (aged 20 and over in 1965).

[3]Previous analyses of white and total population movement in large SMSAs (Frey, 1977a; 1978) indicate that the suburban propensity component rate accounts for well over twice as much inter-SMSA variation in the city-suburb stream mobility rate than does the mobility incidence component rate.

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